

## SPECIAL SECTION

# Innate Immunity

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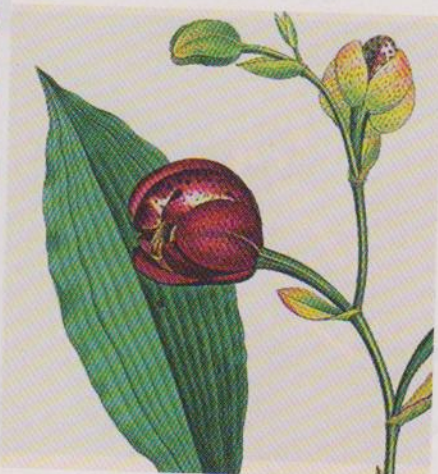


### COVER

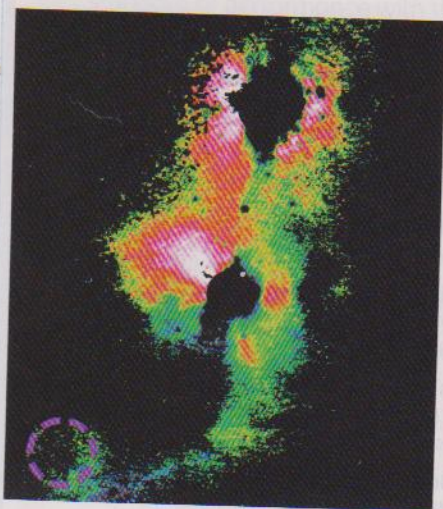
Dendritic cells of the immune system recognize and bind bacteria and other microbes by means of receptors expressed on the dendritic cell membrane and within the cell, thus triggering an immune response. Microbial sensing is associated with the innate arm of the immune system, and recent developments in this area are described in the special section starting on page 283.

Image: *Chris Bickel*

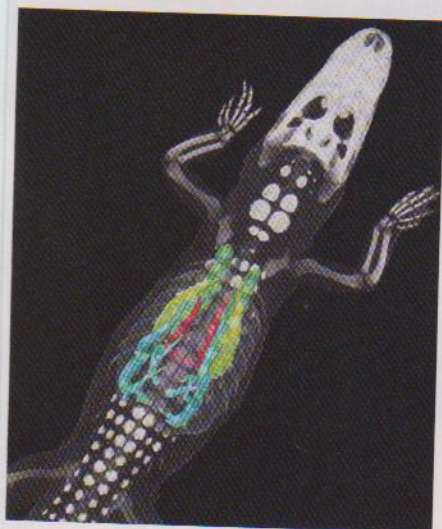




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R. Temperley et al.  
During translation of mitochondrial genes, shifting the ribosome reading frame avoids unconventional arginine codons.

## RESEARCH ARTICLE

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Y. F. Chan et al.  
Loss of a tissue-specific enhancer explains multiple parallel losses of the pelvic girdle in stickleback populations.

## REPORTS

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An infrared image taken with the Subaru Telescope reveals young binary stars and their circumstellar environments.
- 308 **How the Shape of an H-Bonded Network Controls Proton-Coupled Water Activation in HONO Formation**  
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A linkage map for an important medicinal crop plant points to breeding targets for enhancing drug production.  
>> Perspective p. 279
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H. M. Alvarez et al.  
Complex formation between a copper chaperone and a metallo-drug prevents copper transfer to target enzymes.
- 335 **Global Analysis of Short RNAs Reveals Widespread Promoter-Proximal Stalling and Arrest of Pol II in *Drosophila***  
S. Nechaev et al.  
The initially transcribed sequence plays a key role in inducing polymerase stalling.
- 338 **Unidirectional Airflow in the Lungs of Alligators**  
C. G. Farmer and K. Sanders  
Crocodilian and bird lungs share patterns of air flow, indicating a common evolutionary origin.
- 340 **G Protein Subunit Gα<sub>13</sub> Binds to Integrin α<sub>11</sub>β<sub>3</sub> and Mediates Integrin "Outside-In" Signaling**  
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Cell adhesion mediated by integrins is coupled to intracellular signaling by direct binding to G proteins.
- 343 **Functional and Evolutionary Insights from the Genomes of Three Parasitoid *Nasonia* Species**  
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The genomes of three parasitoid wasp species offer insights into speciation, insect evolution, and parasitoid biology.  
>> News story p. 260
- 348 **Zebrafish Behavioral Profiling Links Drugs to Biological Targets and Rest/Wake Regulation**  
J. Rihel et al.  
The effects of most neuroactive drugs are conserved and can be detected by behavioral screening.



## SCIENCEONLINE

## SCIENCEEXPRESS

[www.scienceexpress.org](http://www.scienceexpress.org)

**A Genetic Variant BDNF Polymorphism Alters Extinction Learning in Both Mouse and Human**

E. Soliman et al.

Commonly genetic variation in fear learning operates through the same pathways in mice and men.

10.1126/science.1181886

**Evolutionary Dynamics of Complex Networks of HIV Drug-Resistant Strains: The Case of San Francisco**

R. J. Smith et al.

Modeling of data from the U.S. indicates the potential for an epidemic wave of antiretroviral-resistant HIV.

10.1126/science.1180556

**Ferroelectric Control of Spin Polarization**

X. Garcia et al.

Ferroelectric tunnel junctions control the spin polarization of electrons emitted from iron electrodes.

10.1126/science.1184028

**Effect of Ocean Acidification on Iron Availability to Marine Phytoplankton**

D. Shi et al.

Ocean acidification caused by anthropogenic carbon dioxide is changing the chemistry and bioavailability of iron in seawater.

10.1126/science.1183517

**Deglacial Meltwater Pulse 1B and Younger Dryas Sea Levels Revisited with Boreholes at Tahiti**

E. Bard et al.

A coral-based record of sea level from Tahiti defines changes in the rate of sea-level rise between 14,000 and 9000 years ago.

10.1126/science.1180557

## SCIENCENOW

[www.sciencenow.org](http://www.sciencenow.org)

**Highlights From Our Daily News Coverage**

**Egyptian Eyeliner May Have Warded Off Disease**

Lead-based cosmetics could have killed bacteria on the skin.

**Bering Strait's Ups and Downs Alter Climate**

Rise and fall of the land bridge affect the extent of ice sheets.

**Why Light Makes Migraines Worse**

Researchers trace effect to a particular receptor in the eye.

## SCIENCE SIGNALING

[www.sciencesignaling.org](http://www.sciencesignaling.org)

**The Signal Transduction Knowledge Environment**

**RESEARCH ARTICLE: Extensive Crosstalk Between O-GlcNAcylation and Phosphorylation Regulates Cytokinesis**

Z. Wang et al.

Protein O-GlcNAcylation regulates cell division.

**RESEARCH ARTICLE: Quantitative Phosphoproteomics Reveals Widespread Full Phosphorylation Site Occupancy During Mitosis**

J. V. Olsen et al.

Protein phosphorylation during the cell cycle may be an all-or-none process in many instances.

**PERSPECTIVE: Cyclic Nucleotides Converge on Brown Adipose Tissue Differentiation**

P. S. Amieux and G. S. McKnight

cGMP-mediated signaling pathways are required for the differentiation and function of brown adipocytes.

**REVIEW: Basal Release of ATP—An Autocrine-Paracrine Mechanism for Cell Regulation**

R. Corriden and P. A. Insel

Responses to ATP play an important role in regulating the signaling and function of a diverse array of cells and tissues.

## GLOSSARY

Discover what RANKL and RANK mean in the world of signaling.

## SCIENCE CAREERS

[www.sciencereers.org/career\\_magazine](http://www.sciencereers.org/career_magazine)

**Free Career Resources for Scientists**

**Tenure-Track Jobs Remain Scarce**

S. Carpenter

Although most universities have cut faculty hiring, a few are taking advantage of a rich applicant pool.

**Tooling Up: What's Your Mission?**

D. Jensen

Your unique life philosophy is the cornerstone of your success and job satisfaction.

**Science Careers Blog**

Science Careers Staff

Get frequent advice, opinion, news, funding opportunities, and links to other career resources.

## SCIENCE TRANSLATIONAL MEDICINE

[www.sciencetranslationalmedicine.org](http://www.sciencetranslationalmedicine.org)

**Integrating Medicine and Science**

**PERSPECTIVE: Why Most Gene Expression Signatures of Tumors Have Not Been Useful in the Clinic**

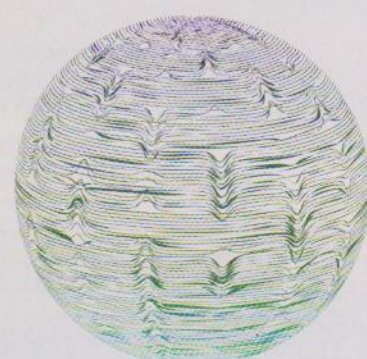
S. Koscielny

Gene microarray literature polluted with invalidated gene expression signatures needs revamping.

**COMMENTARY: Translational Medicine Policy Issues in Infectious Disease**

R. Fears et al.

European policy strategies can guide the scientific community to improve the translational medicine environment.



## SCIENCE SIGNALING

Global view of the cell cycle phosphoproteome.

**RESEARCH ARTICLE: Uncovering Residual Effects of Chronic Sleep Loss on Human Performance**

D. A. Cohen et al.

Sleep loss may be lost forever.

**RESEARCH ARTICLE: Intermittent Prophylaxis with Oral Truvada Protects Macaques from Rectal SHIV Infection**

J. G. Garcia-Lerma et al.

Treating monkeys with an antiretroviral drug before and after exposure to SHIV provides protection against infection.

## SCIENCE PODCAST

[www.sciencemag.org/multimedia/podcast](http://www.sciencemag.org/multimedia/podcast)

**Free Weekly Show**

Download the 15 January Science Podcast to hear about a carbon capture catalyst, parasitoid wasp diversity, innate immunity, and more.

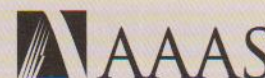
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[blogs.sciencemag.org/scienceinsider](http://blogs.sciencemag.org/scienceinsider)

**Science Policy News and Analysis**

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